Carewest
INNOVATIVE HEALTH CARE

Ear Irrigation Module

For RNs and LPNs

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Ear Irrigation Module: Learning Objectives

Following the review of this module, you will be able to:

- Describe normal anatomy and function of the ear.
- Describe relevant health history questions related to the ear.
- Explain examination of the ear.
- Explain an ear irrigation procedure (indications and precautions).
- Successfully demonstrate an ear irrigation procedure to an Educator or designate.

Anatomy of the Ear

The ear is divided into three (3) anatomic sections:

1. External Ear

The purpose of the external ear is to receive sound waves and direct them to the tympanic membrane. The external ear contains the outer projection (referred to as the auricle or pinna) and the ear canal (referred to as the external auditory meatus or external auditory canal). The ear canal ends at the tympanic membrane (eardrum). The outer half of the ear canal is cartilaginous and the inner part of the adult ear is bony. The skin that lines the cartilaginous portion of the canal is thick and contains fine hairs, large sebaceous glands and the ceruminous glands. Cerumen (ear wax) is the combined secretion of the sebaceous and ceruminous glands.

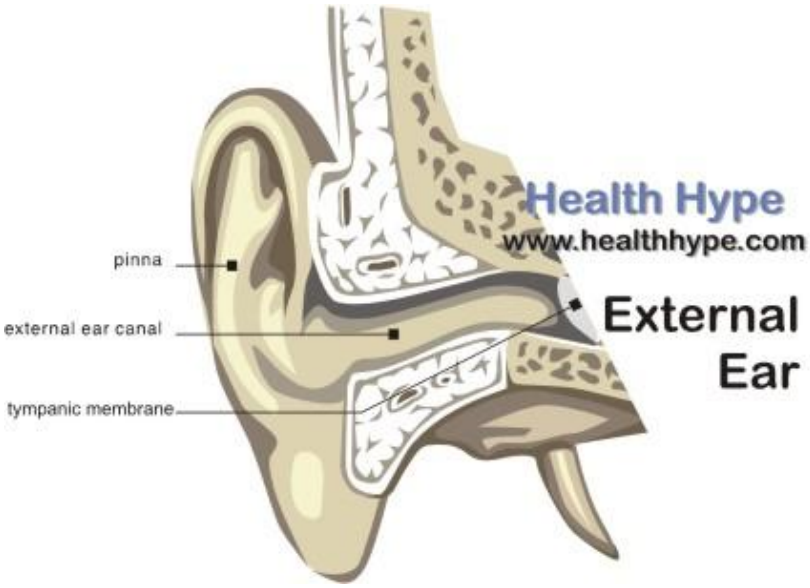


Figure 1 External Ear
Source: http://www.healthhype.com/outer-ear-parts-external-ear-anatomy-diagram-and-pictures.html#prettyPhoto Accessed 2015/Feb/17

2. Middle Ear

The middle ear (tympanic cavity) is covered by the tympanic membrane. This area holds air and three (3) small bones: the malleus (hammer), the incus (anvil) and the stapes (stirrup). The main function of the middle ear is to transfer sound waves from the outer ear to the fluid-filled inner ear. The small bones are joined so they amplify sound waves received by the tympanic membrane and transmit these waves to the inner ear.

The eustachian tube connects the middle ear with the nasopharynx equalizing pressure on each sides of the tympanic membrane.

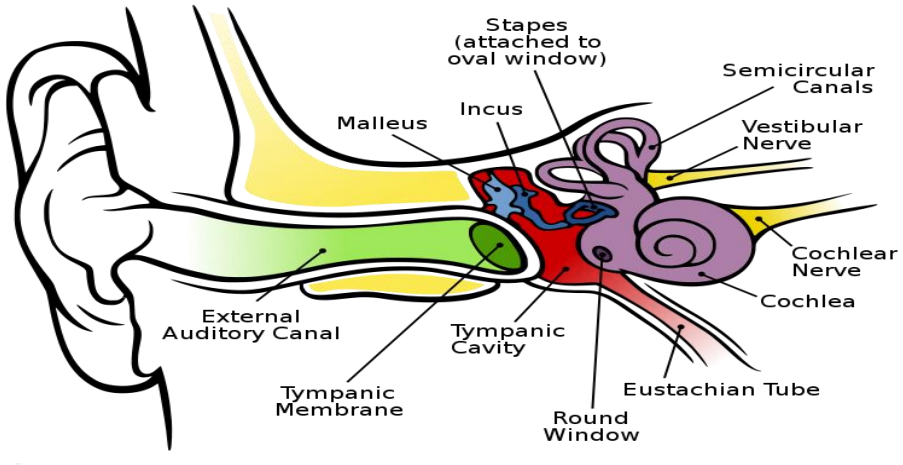


Figure 2: Anatomy of the Human Ear
Source: **http://en.wikipedia.org/wiki/File:Anatomy_of_the_Human_Ear.svg** Accessed on 2015/Feb/17

3. Inner Ear

The organs for hearing and equilibrium are located in the inner ear (labyrinth). Components of the inner ear include the cochlea for hearing, the semicircular canals for equilibrium and the vestibule which houses the components for sensing changes in gravity.

In addition to hearing, the structures of the middle and inner ear play a large role in controlling a person's balance.

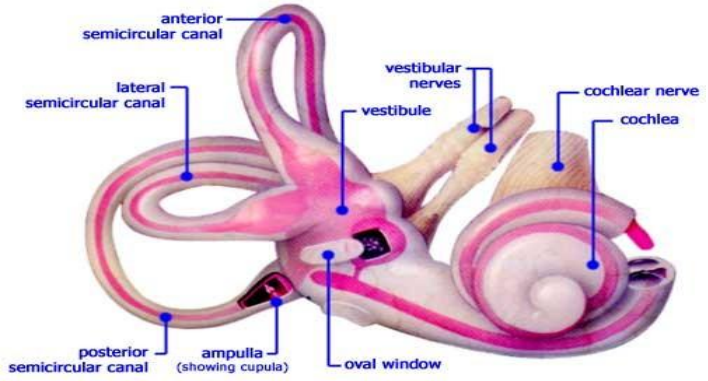


Figure 3: Anatomy of the Inner Ear
Source: http://images.paraorkut.com/img/health/images/i/inner_ear-1732.jpg Accessed on 2015/Feb/17

Ear Wax (Cerumen)

The ear wax is produced only in the outer regions of the auditory canal, where the ceruminous glands are found, but it may be pushed further back into the canal. The color, consistency and amount of ear wax vary from individual to individual. It is normally honey colored but becomes darker brown in color and gradually hardens as it becomes exposed to air.

Cerumen is removed by two natural methods:

- Evaporation.
- Shedding – with dead skin flakes as the skin migrates out of the external auditory canal.

Removal of the wax by ear irrigation may be required for the following reasons:

1. **Narrow ear canal**: Persons with narrow ear canals may find that the wax builds up in the ear canal.

2. **Cleaning attempts**: Using *Q-tips* in an attempt to clean out the ear canals is one of the causes of impacted wax. Instead of removing the wax, this tends to force it down the canal so that it forms a hard dry plug against the tympanic membrane.

3. **Ear plugs**: The use of ear plugs to block out noise (e.g. various occupations require them as mandatory protection, etc.), can also force the wax down the ear canal.

4. **Hearing aid moulds**: Hearing aids are designed to fit inside the auditory canal and may be worn for long periods of time. They can interfere with the natural ability of the body to shed dead skin and wax, which causes a build up in the canal.

5. **Age**: With increased age changes in the sebaceous and apocrine glands leads to drier cerumen. With this change and stiffer, coarse hairs lining the canal, impaction can result. Symptoms of cerumen impaction may include:
   - hearing loss
   - earache
   - feeling of fullness in the ear or a sensation that the ear is plugged
   - itching
   - tinnitus.

History of Ear Problems or Treatments

Taking a history of ear problems or treatments is critical prior to ear irrigation. The fact that the client has had ear irrigation in the past does not mean that there are no contraindications this time.

Ear irrigation is CONTRAINDICATED for the following reasons:

1. If the **tympanic membrane has been perforated in the past** or surgery (e.g. mastoid surgery) has been done, unsterile water may be forced into the middle ear or mastoid cavity. Eardrums can develop holes

or perforations in them. The picture on the far right shows an eardrum with three holes and destruction of the middle ear bones (ossicles).

Figure 4 : Eardrum Perforation www.entusa.com April 2010

2. **Recent or current middle ear infections (otitis media)** as the tympanic membrane may be under pressure from mucous or pus. Negative pressure builds up in the middle ear from the eustachian tube dysfunction (this tube connects the ear to the back of the nose and normally allows enough air into the middle ear). Even short term negative pressure can cause clear fluid to build up behind the eardrum. The eardrum is often retracted or pulled into the middle ear. Irrigation would cause pain and there is the risk of perforating the membrane.

Grade 0: **Normal appearance or effusion only. No erythema**

Grade 1: Erythema only. No effusion, myringitis only

Grade 2: Erythema, air/fluid level no opacification, meniscus noted

Grade 3: Erythema, complete effusion, no opacification

Grade 4: Erythema, partial opacification, no bulging, may include complete effusion (bubbles and/or air fluid level

Grade 5: Erythema, complete effusion noted, opacification (no bulging, no bubbles, no meniscus)

Grade 6: Erythema, bulging, rounded doughnut appearance of tympanic membrane

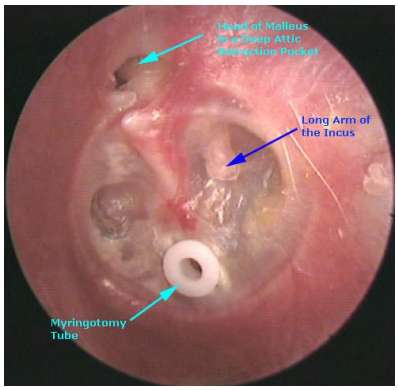
Grade 7: Erythema, bulla

Figure 5: Serous Otitis Media: www.entusa.com

3. **Myringotomy tubes** (grommets). This is a treatment of eustachian tube dysfunction and eardrum retraction pockets by placing an ear tube in the eardrum.

Pre-operative ear with chronic serous otitis media and retraction pocket formation

The "glue" which was suctioned out of the ear



Post operative result

Figure 6: Myringotomy Tube Treatment entusa.com

4. **Painful or edematous ear canal or pinna.**

5. **Clients who have previously experienced complications following ear wax removal.**

Examination of the Ear

1. Examine the external ear canal using observation

The external ear canal may also show signs of otitis externa (swimmer's ear), which is a non-specific inflammation of the skin and subcutaneous tissues of the ear canal. It causes itching and discharge from the ear. The infection can also cause narrowing of the canal due to edema of the tissues lining the canal. Ear irrigation should not be done while canal or pinna are painful or tender (Cook, R. 1998).

2. Examine the external ear canal using an otoscope

To examine the ear canal:

- Explain the procedure to the client.
- Tilt the client's head away from you.
- Gently pull the pinna upwards and backwards to straighten the ear canal.

Figure 7: Examination Using an Otoscope
Source: Grundman, J. & Wigton, R. Examination of the ear.
http://webmedia.unmc.edu/intmed/general/eye&ear/earexam2.htm

Observe for the following:

1. **Canal**
   - Normally pinkish
   - ***Do not irrigate if red, bleeding or you note discharge***

2. **Tympanic membrane**
   - normally a disc at the back which is mother of pearl or white in color
   - ***do not irrigate if eardrum has a hole or you see myringotomy tubes***
   - ***do not irrigate if pink or red***

3. **Wax**
   - Is it present?
   - Describe the location
     - In canal or against eardrum
     - In terms of a clock - compared to tympanic membrane
   - Determine color and consistency
     - Softer if lighter brown or honey colored
     - Drier and harder is dark brown. **Do not irrigate without using oil for several days prior**

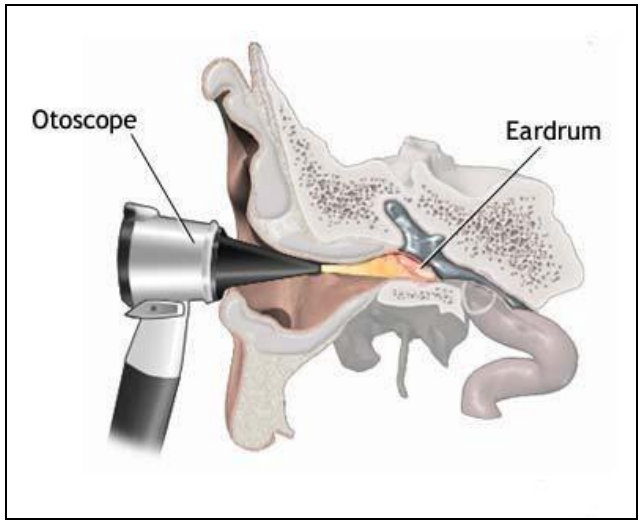


Figure 8: Examination by Otoscope Source: Medical Encyclopedia. http://www.nlm.nih.gov/medlineplus/ency/imagepages/8771.htm accessed on December 5, 2005.

Do NOT irrigate if you notice the following:

- Perforation of the tympanic membrane
- Myringotomy tubes (grommets)
- Otitis Media or recent history of a middle ear infection - tympanic membrane may be under pressure from mucous or pus. Irrigation would cause pain and there is a risk of perforating the membrane
- Otitis Externa or painful/tender edematous ear canal/pinna

PREPARATION REQUIRED PRIOR TO EAR IRRIGATION

Before irrigating the ears, it is important to:

1. Review the Carewest policy (CS-02-04-03).

   Note: ***Demonstrated competence with this procedure is required.*** This includes: reading this training module, answering the quiz questions correctly and demonstrating your skills to an Educator or delegate.

2. Check the client's history of ear problems or treatments.

3. Explain the procedure to the client.

4. Examine the ear using an otoscope. Assess the amount of wax, the size of the canal and confirm no visible inflammation.

   Note: You may want to practice just examining ears before attempting the actual procedure.

5. Ensure that the wax is softened (Carewest policy CS-02-04-03 – Ear Wax (Cerumen) Removal). Instill 3-4 drops of mineral oil into the affected ear(s) nightly for 5-7 nights to hopefully flush the ear wax out spontaneously (Carewest Policy CS-02-04-03).

Ear Irrigation Procedure

At Carewest, a disposable luer lock syringe, 20 mL or larger and OtoClear ® tip are used for ear irrigation. **The OtoClear® Tip and attached syringe are Single Use only**. In these pictures we have used a 60 mL syringe, however anything from 20 mL - 60 mL may be used. When a 60 mL syringe is used there may be slightly less pressure. Carewest supports starting with less pressure and then increasing it as needed by using a smaller syringe.

Figure 9: OtoClear® tip and a 60 mL Luer Lock syringe

Benefits of this system:

- **Flare-tip design** - OtoClear® tips cannot be over-inserted into the ear canal.
- **Safety First** - Three tiny holes spray the water at a 45° angle virtually eliminating the risk of damage to the tympanic membrane.
- **Easy exit for debris** - Exit portals let the water and debris drain in a controlled manner, keeping you and your clients clean and dry.
- **Client Comfort** - Clients experience the sensation of a plastic receptacle.

Procedure:

1. Wash hands.
2. Collect all equipment and connect the parts.
3. Explain the procedure to the client.
4. Drape a towel around the client's shoulder and if possible have the client lean in the same direction as the ear that is being irrigated. This will allow gravity to help drain the water from the ear. If the client is able to help, they can hold the bowl or basin against the neck beneath the ear.
5. Twist a new OtoClear® tip to a disposable luer lock syringe – 20 mL or larger.

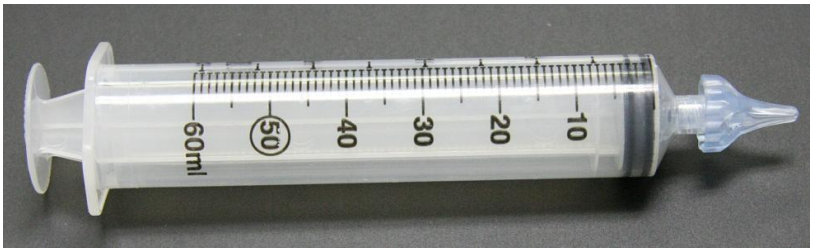


Figure 10: OtoClear® tip attached to a 60 mL syringe.

6. Fill the syringe with body temperature water. Check the water temperature by squirting water on the inside of your wrist.

Figure 11: OtoClear® tip and syringe inserted into external ear canal

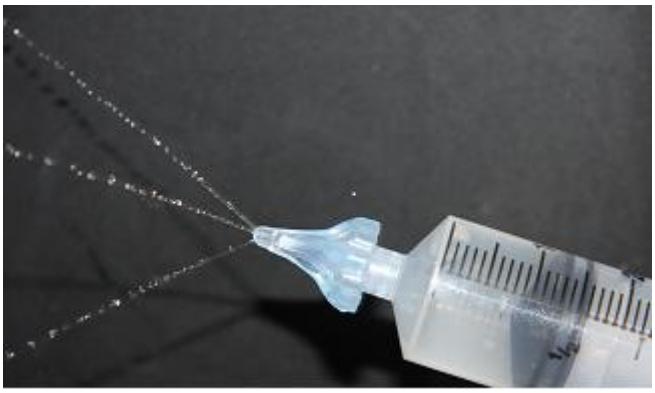


Figure 12: What the spray looks like out of the OtoClear® tip

7. Begin irrigation:
    - Place plastic tip into the ear canal. OtoClear® tips cannot be over-inserted into the ear canal.
    - Straighten the ear canal by pulling the pinna gently upwards and backwards with one hand.
    - Use the other hand to control the stream of water as you slowly depress the plunger while the water enters the ear canal.
    - Observe for and stop at signs of pain, nausea or dizziness.
8. After approximately 15 seconds, stop the infusion of water and withdraw the OtoClear® tip.
9. Check the ear canal using an otoscope to determine if more irrigation is required. Repeat as necessary.
10. Discard the OtoClear® tip and syringe. **These are single use only**.
12. Wash your hands.
13. Document the outcome and response on the *Total Team Record*.
    - Color, texture and size of the cerumen (wax) and any odor
    - How the client tolerated the procedure (any pain or dizziness)

If you were unable to dislodge the wax, continue to instill oil into the ear(s) for several (5 – 7) days. Irrigate again and reassess.

Complications

Complications associated with ear irrigation include:

- Pain or vertigo during the procedure
- Trauma/rupture to the tympanic membrane
- Otitis externa
- External auditory meatus damage.

After completing the attached Ear Irrigation Module Quiz, contact your Site Educator to arrange a time for you to demonstrate your skills.

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Ear Irrigation Module – Quiz **Name: _____ Site: _____** ____/15

Date: YYYY/Mon/DD

You must receive 80% pass grade before you are able to demonstrate your skills to an educator/designate. Return the completed quiz to your site educator for marking.

1. Ear wax is produced in the:
    a. Eustachian tube
    b. Outer region of the auditory canal
    c. Middle ear
    d. Labyrinth

2. The three (3) small bones of the middle ear are:
    a. Malleus, incus and stapes
    b. Anvil, hammer and stapes
    c. Hammer, inca, and stapes
    d. Malleus, anvil and stirrup

3. The ear canal is also referred to as the:
    a. External auditory canal
    b. Internal auditory canal
    c. External auditory meatus
    d. a and c

4. Prior to ear irrigation you:
    a. Take a history of any ear problems or treatments
    b. Review the Carewest policy on Earwax [Cerumen] Removal
    c. Conduct an examination of the ear
    d. Ensure the wax is softened to aid removal
    e. all of the above

5. When reviewing the history for your client, they tell you that they have had mastoid surgery in the past. Ear irrigation may be contraindicated because:
    a. The eardrum would have been perforated
    b. She may experience nausea with ear irrigation
    c. Water may enter the mastoid cavity
    d. The malleus could be damaged

6. Ear irrigation is contraindicated in which of the following:
    a. Perforation of the tympanic membrane
    b. Myringotomy tubes (grommets) are in place
    c. Recent history of a middle ear infection
    d. Otitis externa or media
    e. All of the above

7. The OtoClear® is for single use only
    a. True
    b. False

8. A cerumen plug can cause:
    a. Dizziness
    b. Pain
    c. Itching
    d. Decreased hearing
    e. All of the above

9. Name all of the necessary equipment needed to perform an ear irrigation procedure:
    a. A disposable 20mL or larger Luer-lock syringe
    b. A disposable OtoClear tip®
    c. A kidney basin
    d. A towel to put over the shoulder
    e. All of the above

10. Removal of ear wax by irrigation may be required due to:
    a. A narrow ear canal
    b. A wide ear canal
    c. Hearing aid moulds
    d. Age
    e. b and c only
    f. a, c and d only

11. To examine the ear canal in an adult, gently pull the pinna:
    a. Upwards and backwards
    b. Downwards and outwards
    c. Downwards and forwards
    d. Upwards and forwards

12. What size of syringe should you attach the OtoClear® tip to?
    a. 20 mL or smaller
    b. 20 mL or larger
    c. It does not matter as long at it has a luer lock

13. Name four (4) potential complications with ear syringing:
    a. Pain or vertigo during the procedure
    b. Trauma/rupture of the tympanic membrane
    c. Otitis externa
    d. External auditory meatus damage
    e. All of the above

14. Cold water should be used in this procedure
    a. True
    b. False

15. Ear syringing is an advanced competency in nursing and requires learning and following specified procedures and proper training.
    a. True
    b. False